

Docket No. 2001-005-DSK

CLAIMS:

What is claimed is:

1 1. A method of performing an instant copy of data,  
2 comprising:  
3 receiving a write operation to a data location in  
4 one of an initial physical storage area and an additional  
5 physical storage area;  
6 performing an instant copy operation on the data  
7 location; and  
8 writing new data to the data location in accordance  
9 with the write operation, wherein the instant copy  
10 operation includes generating a pointer to one of the  
11 new data and original data in the data location.

2. The method of claim 1, wherein the data location is in the initial physical storage area, and wherein the instant copy operation includes copying a portion of original data from the data location in the initial physical storage area to a second data location in the additional physical storage area in response to receiving the write operation.

1     3.     The method of claim 2, wherein the pointer points to  
2     the portion of original data copied to the additional  
3     physical storage area.

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4. The method of claim 1, wherein the data location is in the additional physical storage area.

1 6. The method of claim 4, wherein the pointer points to  
2 new data written to the data location in the additional  
3 physical storage area.

1 7. The method of claim 1, wherein the initial physical  
2 storage area is a variable dynamically changeable mapping  
3 scheme storage area.

1 8. The method of claim 2, wherein the portion of  
2 original data has a size that is different with respect  
3 to other portions of data in the initial physical storage  
4 area.

1 9. The method of claim 1, wherein the pointer is  
2 generated in a pointer table of meta-data associated with  
3 the additional physical storage area.

1 10. The method of claim 8, further comprising storing  
2 the pointer and an associated size of the portion of  
3 original data in a meta-data data structure.

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1 11. The method of claim 1, wherein the pointer is stored  
2 in a pointer table of meta-data having a plurality of  
3 pointers, and wherein the plurality of pointers include a  
4 pair of pointers representing a range of pointers that  
5 point to portions of original data that have not been  
6 changed by a write operation.

1 12. A computer program product in a computer  
2 readable medium for performing an instant copy of data,  
3 comprising:

4 first instructions for receiving a write operation  
5 to a data location in one of an initial physical storage  
6 area and an additional physical storage area;

7 second instructions for performing an instant copy  
8 operation on the data location; and

9 third instructions for writing new data to the data  
10 location in accordance with the write operation, wherein  
11 the instant copy operation includes generating a pointer  
12 to one of the new data and original data in the data  
13 location.

1 13. The computer program product of claim 12, wherein  
2 the data location is in the initial physical storage  
3 area, and wherein the second instructions for performing  
4 an instant copy operation include instructions for  
5 copying a portion of original data from the data location  
6 in the initial physical storage area to a second data

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7 location in the additional physical storage area in  
8 response to receiving the write operation.

1 14. The computer program product of claim 13, wherein  
2 the pointer points to the portion of original data copied  
3 to the additional physical storage area.

1 15. The computer program product of claim 12, wherein  
2 the data location is in the additional physical storage  
3 area.

1 16. The computer program product of claim 15, wherein  
2 the second instructions for performing the instant copy  
3 operation include instructions for not copying a portion  
4 of original data from the initial physical storage area  
5 to the additional physical storage area.

1 17. The computer program product of claim 15, wherein  
2 the pointer points to new data written to the data  
3 location in the additional physical storage area.

1 18. The computer program product of claim 12, wherein  
2 the initial physical storage area is a variable  
3 dynamically changeable mapping scheme storage area.

1 19. The computer program product of claim 13, wherein  
2 the portion of original data has a size that is different

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with respect to other portions of data in the initial physical storage area.

21. The computer program product of claim 19, wherein  
the second instructions for performing the instant copy  
operation include instructions for storing the pointer  
and an associated size of the portion of original data in  
a meta-data data structure.

22. The computer program product of claim 12, wherein the second instructions for performing the instant copy operation include instructions for storing the pointer in a pointer table of meta-data having a plurality of pointers, and wherein the plurality of pointers include a pair of pointers representing a range of pointers that point to portions of original data that have not been changed by a write operation.

1 23. An apparatus for performing an instant copy of data,  
2 comprising:

3 means for receiving a write operation to a data  
4 location in one of an initial physical storage area and  
5 an additional physical storage area;  
6 means for performing an instant copy operation on  
7 the data location; and  
8 means for writing new data to the data location in  
9 accordance with the write operation, wherein the instant  
10 copy operation includes generating a pointer to one of  
11 the new data and original data in the data location.